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ABSTRACT

In the spring of 1991, officials from Lamar High School in Houston (Texas) requested a study of their tracking system and its relation to student achievement. This paper reports the results of the evaluation. Many of the courses at Lamar High School are associated with four instructional levels: (1) remedial; (2) regular; (3) college bound; and (4) international baccalaureate. The study evaluated the performance by students in the four tracks on the Texas Assessment of Academic Skills (TAAS), the state's criterion-referenced basic skills test; and the Metropolitan Achievement Test (MATS), a norm-referenced test. For grade 9, there were 661 students in all four mathematics tracks, 634 students in the four English instructional tracks for reading, and 633 students in the four English tracks for writing. For grade 11, there were 433 students in all four mathematics tracks, 476 students in the four English instructional tracks for reading, and 479 students in the four English tracks for writing. Achievement data from both tests support the assertion that students in the separate levels work at different levels of achievement. Test results also provided evidence that students in each of the instructional tracks are achieving appropriate academic growth. Twenty-eight graphs and four tables present achievement data. An appendix with an additional 18 figures gives comparisons for magnet, zoned, and non-zoned students. (SLD)

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Lamar High School: Instructional Tracks and Student Achievement (1990/91)

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Lamar High School: Instructional Tracks and Student Achievement (1990/91)

Abstract

Lamar High School offers courses associated with four instructional levels (Remedial, Regular, College Bound, International Baccalaureate). These tracks are designed to meet the instructional needs of students working at different levels of achievement. An analysis of achievement data (TAAS and MAT6) of students from these four levels supports the assertion that the students in these groups do work at different levels of academic achievement. The achievement data also provides evidence that students in each of the instructional tracks are achieving appropriate academic growth.

Introduction

During the spring semester of 1991, officials from Lamar High School requested a study of their tracking system and its relation to student achievement. Many of Lamar's courses are associated with one of four instructional levels, or tracks: Remedial, Regular, College Bound, International Baccalaureate. The basic intent of the study was to ascertain the levels of performance by students in the four tracks on two tests: the Texas Assessment of Academic Skills (TAAS), the state's criterion referenced basic skills test, and the Metropolitan Achievement Tests–6th Edition (MAT6), a norm-referenced achievement test. In high school, TAAS is given in grades 9 and 11 and MAT6 is given districtwide only in grade 9.

Results from these two types of tests could be used to address two fundamental questions about Lamar's tracking system. First, are students actually being grouped according to different achievement levels? That is to say, do the achievement levels exhibited by the students in the different tracks support the assertion that the four tracked populations are indeed distinct populations. This question requires a comparison of the achievement levels of the different tracks. Since the TAAS tests are given at the beginning of the school year and measure skills learned in previous years, TAAS mastery rates provide an appropriate measure to respond to this question.

Secondly, are the four tracks accomplishing their goal? That is to say, do the test scores support the assertion that students in each of the four tracks are demonstrating a year's intellectual growth. This question requires a comparison, within each track, of test scores received after the instructional treatment with achievement levels attained before the current course of study was begun. Since the MAT6 tests are administered at the end of each school year and can thus provide both a before (8th grade) and after (9th grade) test score, MAT6 scores will be used to respond to the second question.

Research Questions

1. What were the differences in performance between the four tracking groups on the October, 1990 TAAS tests?

2. Did students in each of the four tracks demonstrate appropriate academic growth during the 1990-91 school year as measured by the MAT6 Achievement test?

An appendix contains additional test score information comparing students who were zoned to Lamar and those who were not and magnet students and non-magnet students.

Method

Lamar H.S. supplied a computer diskette containing a roster of students along with demographic information and course load numbers and a list of the course numbers associated with the four instructional tracks. Student IDs were matched against the various research tapes containing TAAS and MAT6 scores to find scores for each student. Details on the number of students that could be successfully matched to the various courses and test scores are to be found in the sections dealing with particular tracks or test scores. The specific methodologies applying to each research question will be explained as that research question is addressed.

Research Question 1

What were the differences in performance between the four tracking groups on the October, 1990 TAAS tests?

Method

For the TAAS subtests, the percent in each tracking group that mastered the test as well as the percent achieving the academic recognition standard was calculated. Chi-Square (χ^2) and Spearman Correlation (ρ) statistics were calculated on the results. In cases where the expected value was less than 5, Fisher's Exact Test was substituted for the χ^2. The Spearman Correlation ranked tracks in the following order: Remedial, Regular, College Bound, and International Baccalaureate. In addition, frequency distribution charts for all four tracks in each subject area were generated for grades 9 and 11.

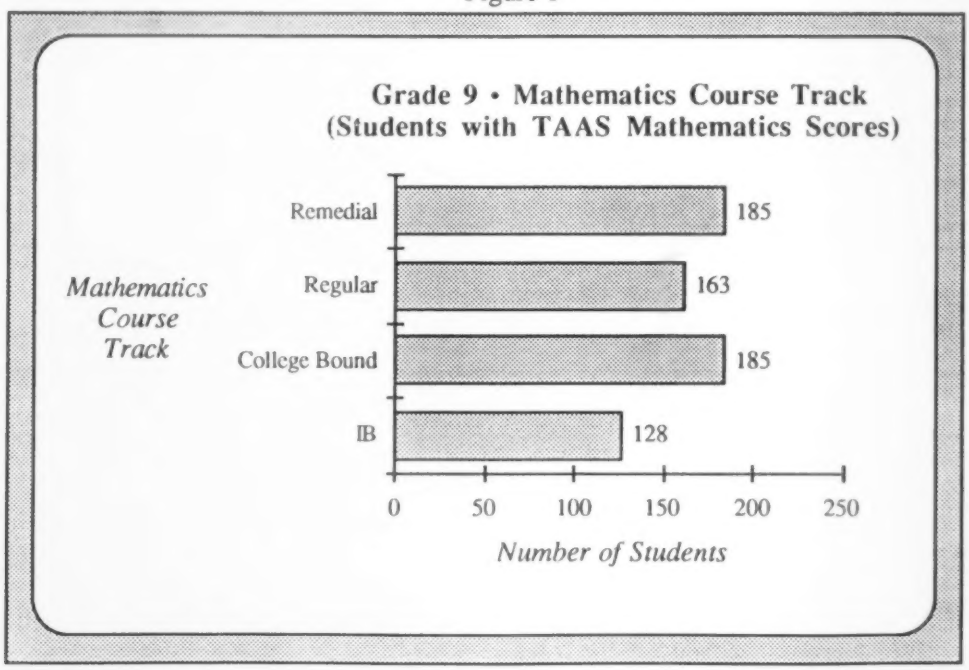
Findings

Ninth Grade TAAS Results

Mathematics

Figure 1 displays the number of students taking the grade 9 TAAS Math subtest by course track. TAAS ninth grade mathematics scores were successfully matched to a total of 661 students in the four mathematics tracks.

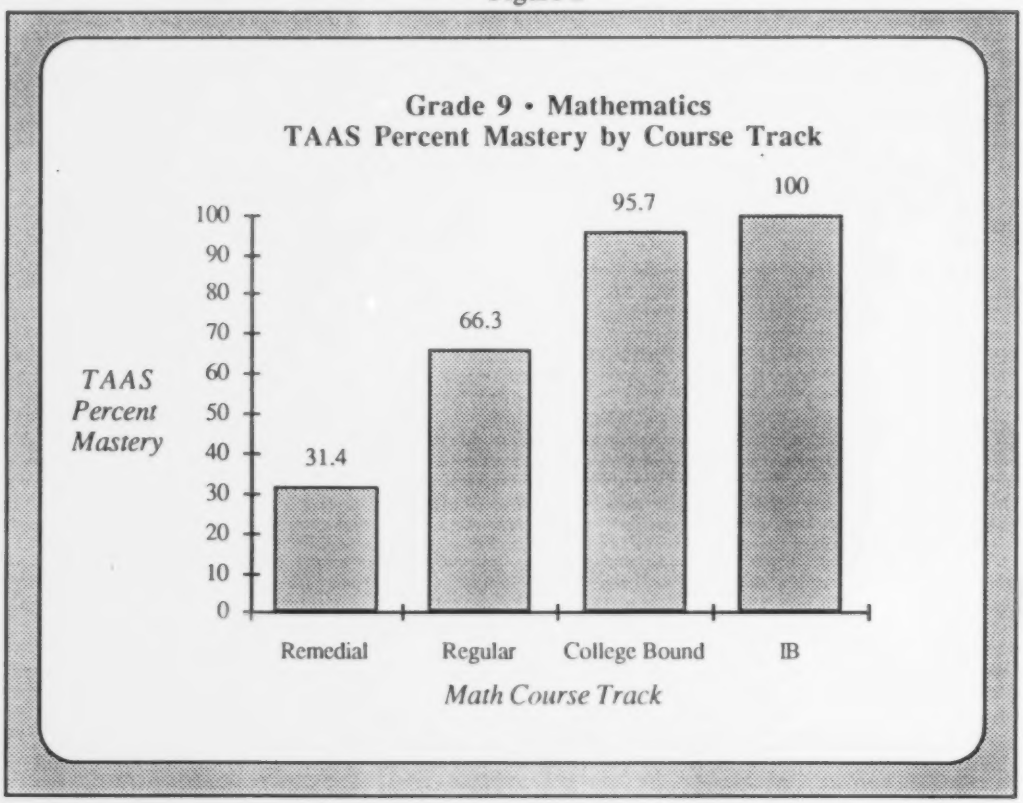
Figure 1



Remedial track students made up 28% of the total students matched in the ninth grade TAAS mathematics subtest, Regular track students made up 24.7%, the College Bound students comprised 28% of the total and IB track students comprised 19.4%.

Figure 2 illustrates the percent of students in each track, based on mathematics courses, that demonstrated mastery of the material on the ninth grade TAAS mathematics subtest. The overall passing rate for the 661 total students was 71.3%.

Figure 2



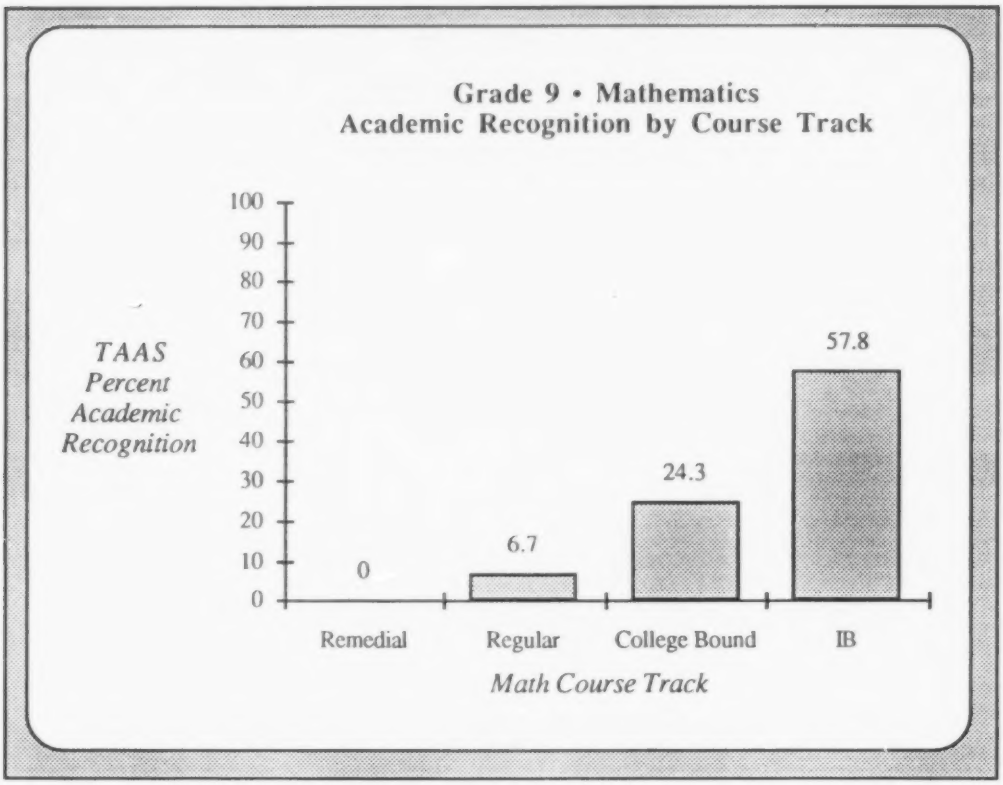
The differences in performance levels of the students allocated to the four instructional course tracks are large enough to demand rejection of the hypothesis that TAAS performance and Mathematics course track are independent of each other (χ^2 (3, N=661)=251.31, p≤.000005). The rank correlation indicates that 35.5% of the variance in passing rates would be explained by taking course track into account (ρ =.59580).

However, the difference between College Bound and IB track mastery rates does not provide as clear-cut a distinction. College bound students passed the mathematics subtest at a 95.7% rate while 100% of IB students passed. If the students in these two tracks were samples randomly drawn from an overarching population, a difference of this magnitude would occur 1.4 percent of the time by chance (Fisher's Exact Test (N=313, One-Tail) p=.01398).

Of note is the fact that 31.4 percent (58 students) of the students taking remedial mathematics courses demonstrated mastery of the material on the TAAS ninth grade mathematics subtest. That is to say, 58 of the ninth grade students who were judged to be unready for regular track ninth grade mathematics courses were deemed to have mastered the content of regular eighth grade mathematics by the TAAS subtest. Also of note is the fact that 33.7% (55 students) of the students in regular mathematics courses failed to pass the TAAS mathematics subtest.

Figure 3 shows the percent of students in each track that achieved the academic recognition level on the grade 9 TAAS mathematics subtest. Of the total student group of 661 students, 130 (19.7%) achieved this more stringent standard.

Figure 3



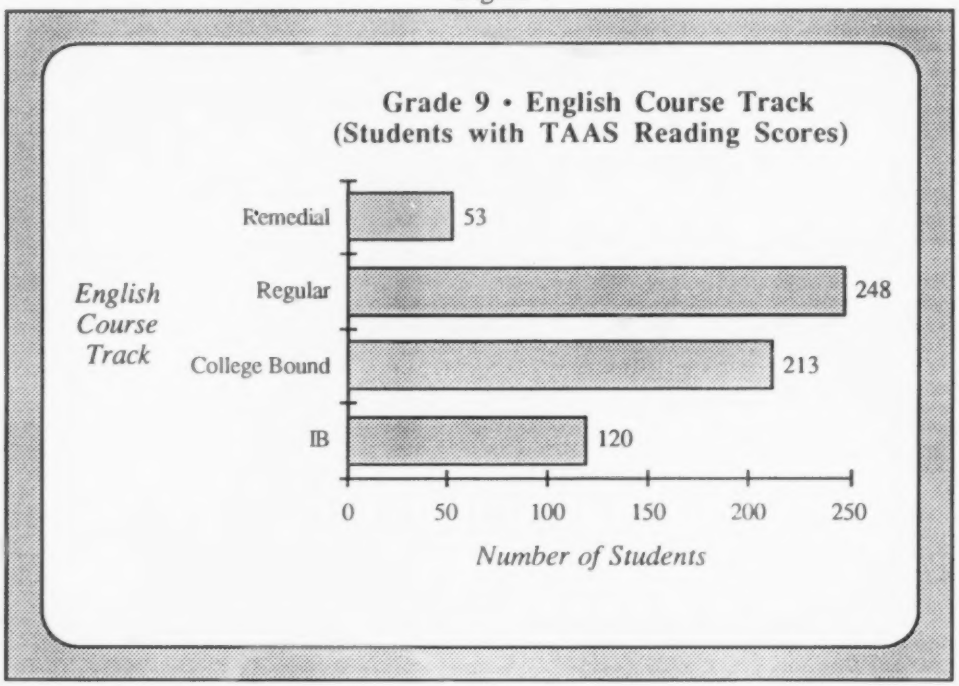
The differences in academic recognition rates of the different course tracks demand rejection of the hypothesis that TAAS performance and Mathematics course track function independently of each other (χ^2 (3, N=661)=182.93 , p ≤.000005). The rank correlation indicates that 24.5% of the variance in academic recognition rates would be explained by taking course track into account (ρ=.49469).

Unlike the difference observed between College Bound and the IB track mastery rates, the difference between College Bound and IB academic recognition rates is substantial enough to support the assertion that different groups are involved (χ^2 (1, N=313)=36.00, p ≤.000005). College bound 9th graders achieved academic recognition rates of 24.3% compared to 57.8% for IB 9th graders.

Reading

Figure 4 displays the number of students taking the TAAS Reading subtest by English course track. TAAS ninth grade reading scores were successfully matched to a total of 634 students in the four English instructional tracks.

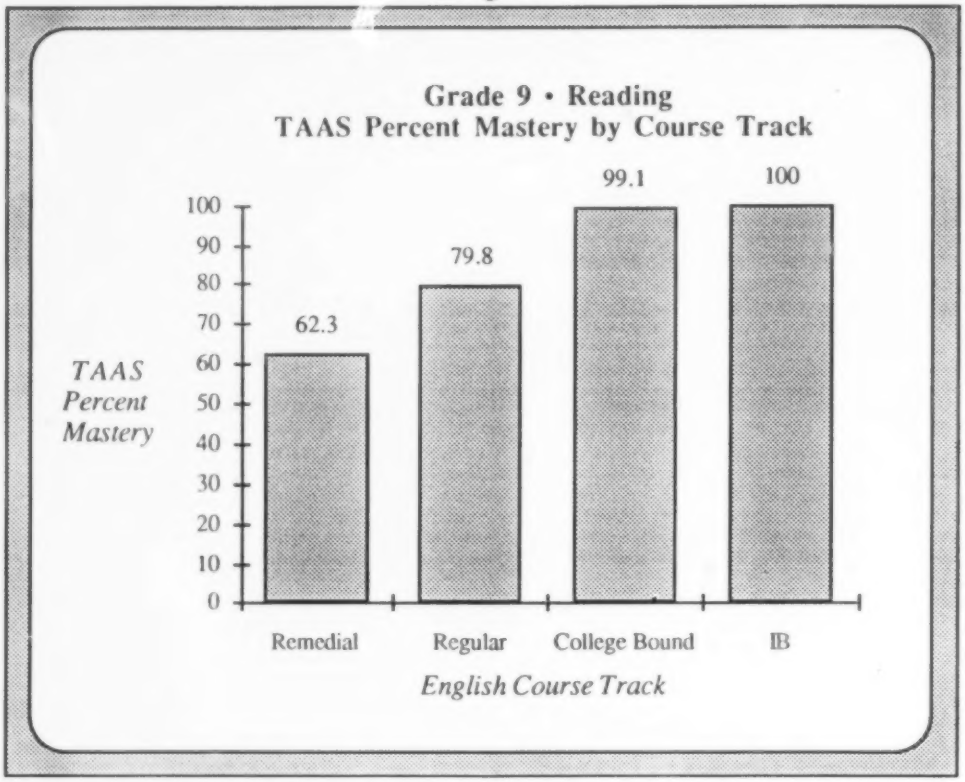
Figure 4



Remedial track students made up 8.4% of the total students matched in the ninth grade TAAS reading subtest, Regular track students made up 39.1%, College Bound students comprised 33.6% and IB students made up 18.9% of the total.

Figure 5 illustrates the percent of students in each track, based on English courses, that demonstrated mastery of the material on the ninth grade TAAS reading subtest. The overall passing rate for the 634 total students was 88.6%.

Figure 5



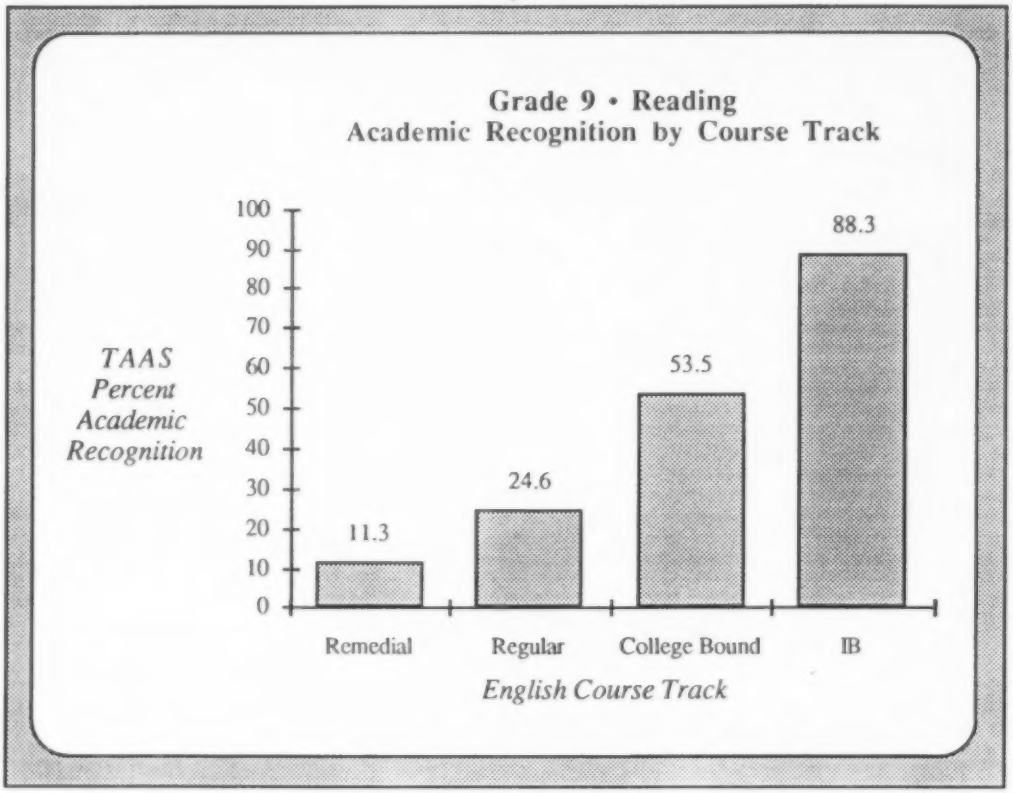
The differences in performance levels of the students allocated to the four course tracks are large enough to demand rejection of the hypothesis that TAAS performance and English course track are independent of each other (χ^2 (3, N=634)=94.1, p ≤.000005). The rank correlation indicates that 13% of the variance in passing rates would be explained by taking course track into account (ρ=.36263).

College bound students passed the reading subtest at a 99.1% rate and IB students passed at a 100% rate. If the students in these two tracks were samples randomly drawn from the same population, a difference of this magnitude would occur 40 percent of the time (Fisher's Exact Test (N=333, One-Tail) p=.40844).

Of note is the fact that 62.3 percent (33 students) of the students taking remedial English courses demonstrated mastery of the material on the TAAS ninth grade reading subtest. That is to say, 33 of the ninth grade students who were judged to be unready for Regular track ninth grade English courses were deemed to have mastered the content of regular eighth grade reading by the TAAS test. Also of note is the fact that 20.2% (50 students) of the students in regular English courses failed to pass the TAAS reading subtest.

Figure 6 illustrates the percent of students in each track that achieved the academic recognition standard on the grade 9 TAAS reading subtest. Of the total student group of 634 students, 45.3% achieved this more stringent standard.

Figure 6



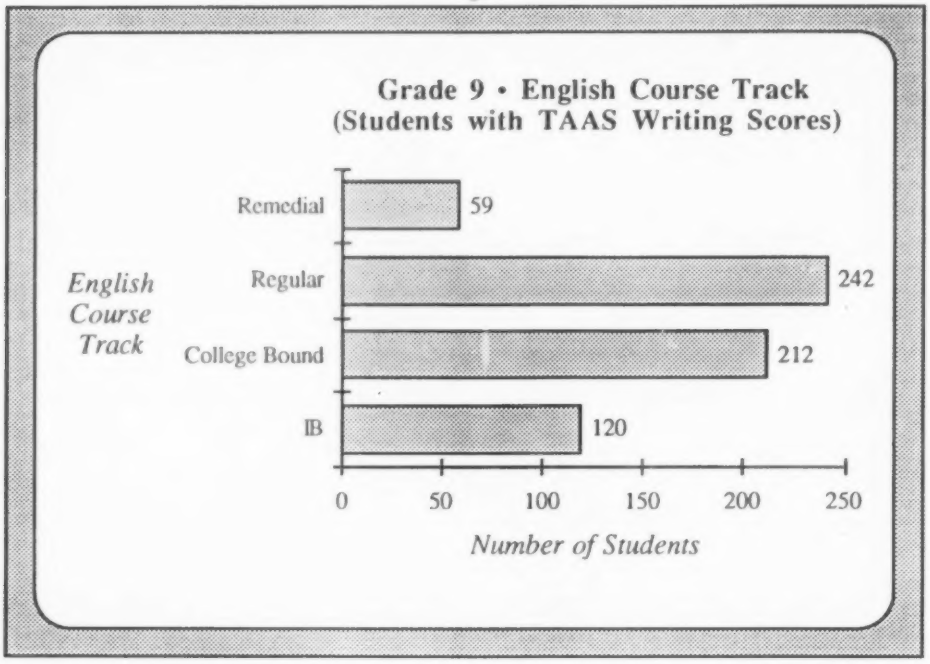
The differences in academic recognition rates of the different course tracks provide evidence that TAAS performance and English course track are related to each other (χ^2 (3, N=634)=163.11, $p \leq .000005$). The rank correlation indicates that 24.9% of the variance in academic recognition rates would be explained by taking course track into account (ρ =.49923).

Unlike the miniscule difference between College Bound and the IB track mastery rates, the difference between College Bound and IB academic recognition rates is substantial enough to dismiss the idea that such a difference arose by chance (χ^2 (1, N=333)=41.49, $p \leq .000005$). College bound 9th graders achieved academic recognition rates of 53.5% compared to 88.3% for IB 9th graders.

Writing

The number of ninth grade students taking English courses aligned with particular instructional tracks and having TAAS reading scores is illustrated in Figure 7. TAAS ninth grade writing scores were successfully matched to a total of 633 students in the four English tracks.

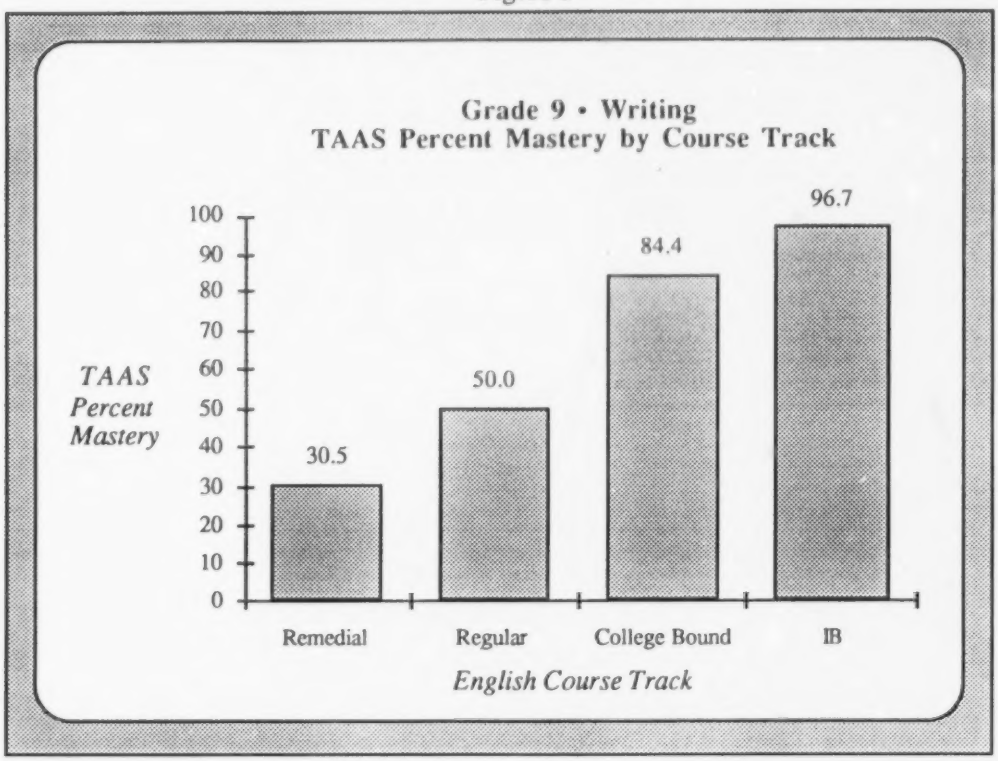
Figure 7



Remedial track students made up 9.3% of the total number of students taking the ninth grade TAAS writing subtest, Regular track students made up 38.2%, College Bound students comprised 33.5% and IB students comprised 19% of the total.

Figure 8 illustrates the percent of students in each track, based on English courses, that demonstrated mastery of the material on the ninth grade TAAS writing subtest. The overall passing rate for the 633 total students was 68.6%.

Figure 8



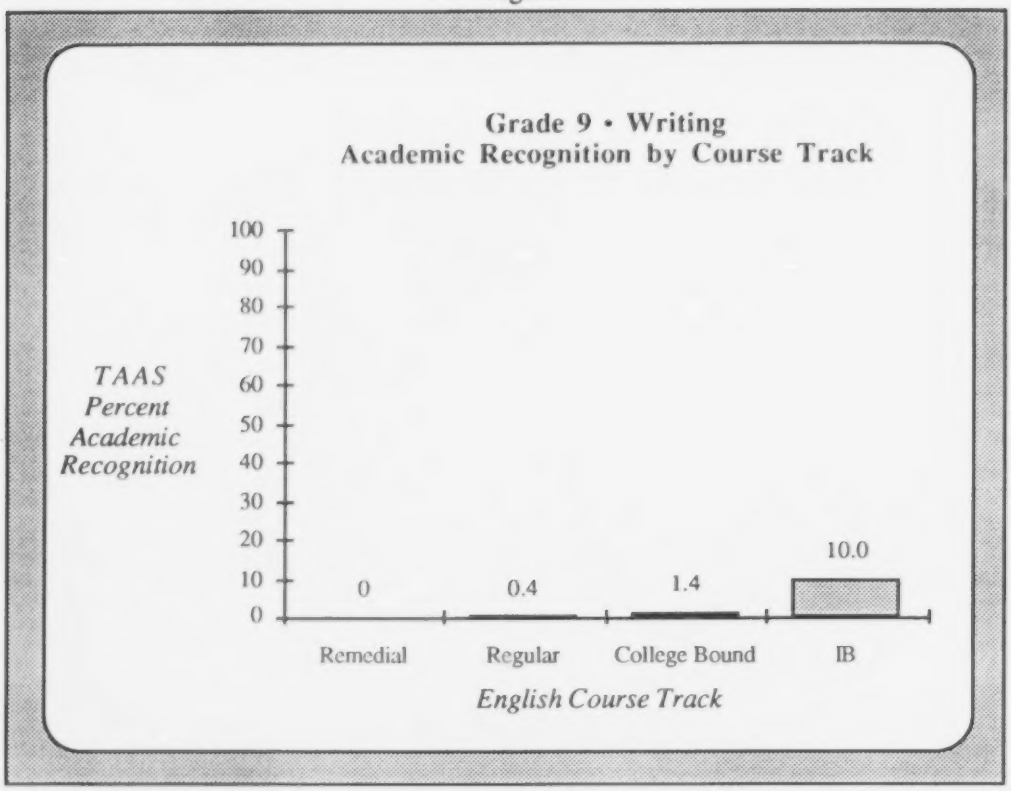
The sizes of the differences in mastery levels of the students allocated to the four course tracks do not support the notion that TAAS performance and English course track are independent of each other (χ^2 (3, N=633)=147.1, p ≤.000005). The rank correlation indicates that 23% of the variance in passing rates would be explained by taking course track into account (ρ=.47669).

Unlike the mathematics and reading subtests in the ninth grade, the College Bound and IB track mastery rates for writing are more distinct. On the writing subtest, there is a 12.3 percentage point difference between the College Bound and IB mastery rates. Mastery rates for the other two subtests at the ninth grade level showed a difference of no more than 4.3 percentage points between the College Bound and IB tracks.

Fifty percent (121 students) of the students taking Regular track English courses failed to master the material on the TAAS ninth grade writing subtest. In addition, 15.6% (33 students) of students in the College Bound track failed to master the writing subtest.

Figure 9 illustrates the percent of students in each track that achieved the academic recognition standard on the grade 9 TAAS writing subtest. Of the total student group of 633 students, only 2.5% or 16 students out of 617 achieved this more stringent standard.

Figure 9



While the differences in academic recognition rates of the different course tracks argue against the idea that TAAS performance and instructional track function independently of each other (χ^2 (3, N=633)=34.2, p ≤.000005), the rank correlation indicates that only 3.5% of the variance in academic recognition rates would be explained by taking course track into account (ρ =.18665).

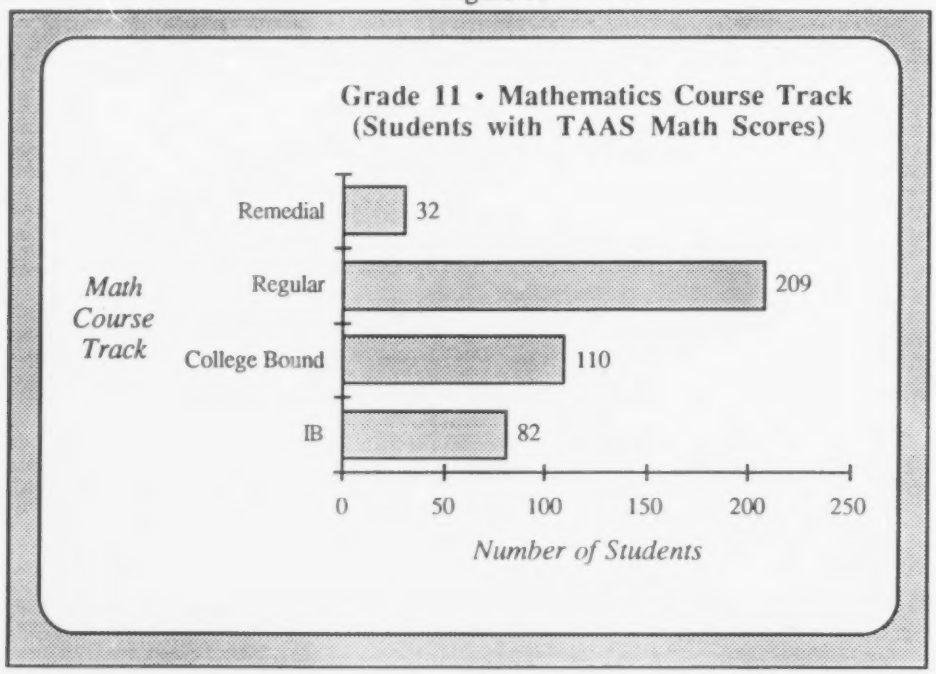
Like the difference observed between College Bound and the IB track mastery rates, the difference between College Bound and IB academic recognition rates is substantial enough to demand rejection of the hypothesis that such a difference is a statistical anomaly (χ^2 (1, N=332)=13.09, p=.0003). College Bound 9th graders achieved academic recognition rates of 1.4% compared to 10.0% for IB 9th graders.

Findings

Mathematics

The number of eleventh grade students taking mathematics courses aligned with particular tracks and having TAAS mathematics scores is illustrated in Figure 10. TAAS eleventh grade mathematics scores were successfully matched to a total of 433 students in the four math tracks.

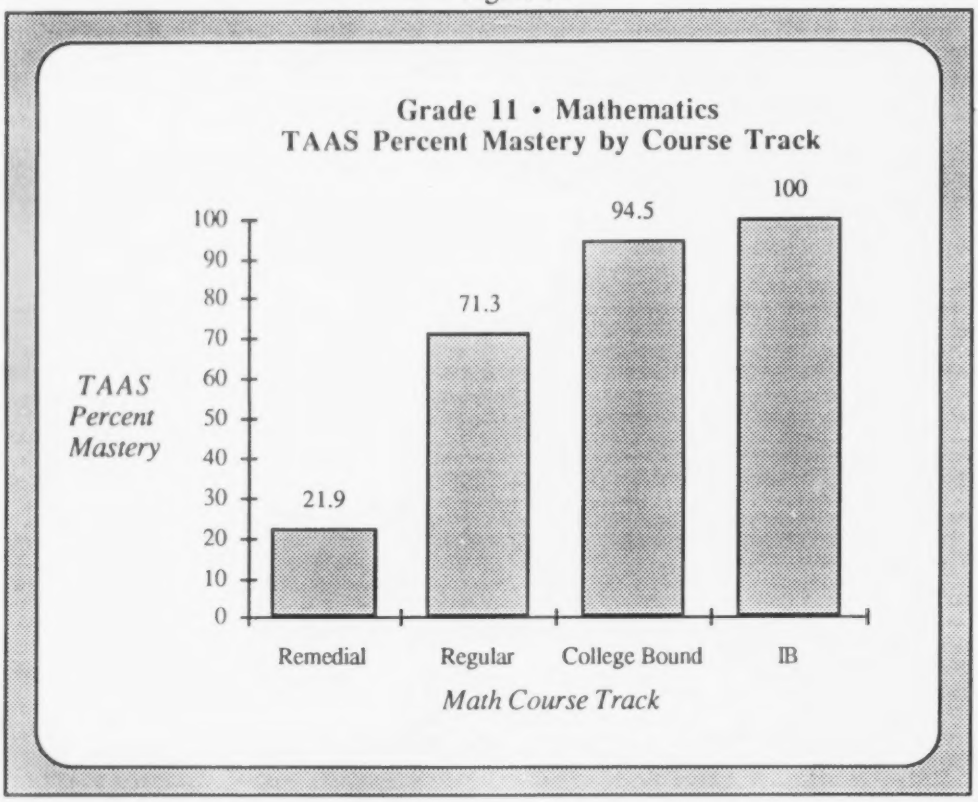
Figure 10



Remedial track students made up 7.4% of the total students taking the eleventh grade TAAS mathematics subtest, Regular track students made up 48.3%, College Bound students comprised 25.4% of the total and IB students comprised 18.9%.

Figure 11 illustrates the percent of students in each track, based on mathematics courses, that demonstrated mastery of the material on the eleventh grade TAAS mathematics subtest. The overall passing rate for the 433 total students was 79%.

Figure 11



The differences in performance levels of the students allocated to the four course tracks are large enough to demand rejection of the hypothesis that TAAS performance and mathematics course track are independent of each other (χ^2 (3, N=433)=108.2, $p \leq .000005$). The rank correlation indicates that 20.7% of the variance in passing rates would be explained by taking course track into account ($\rho = .45547$).

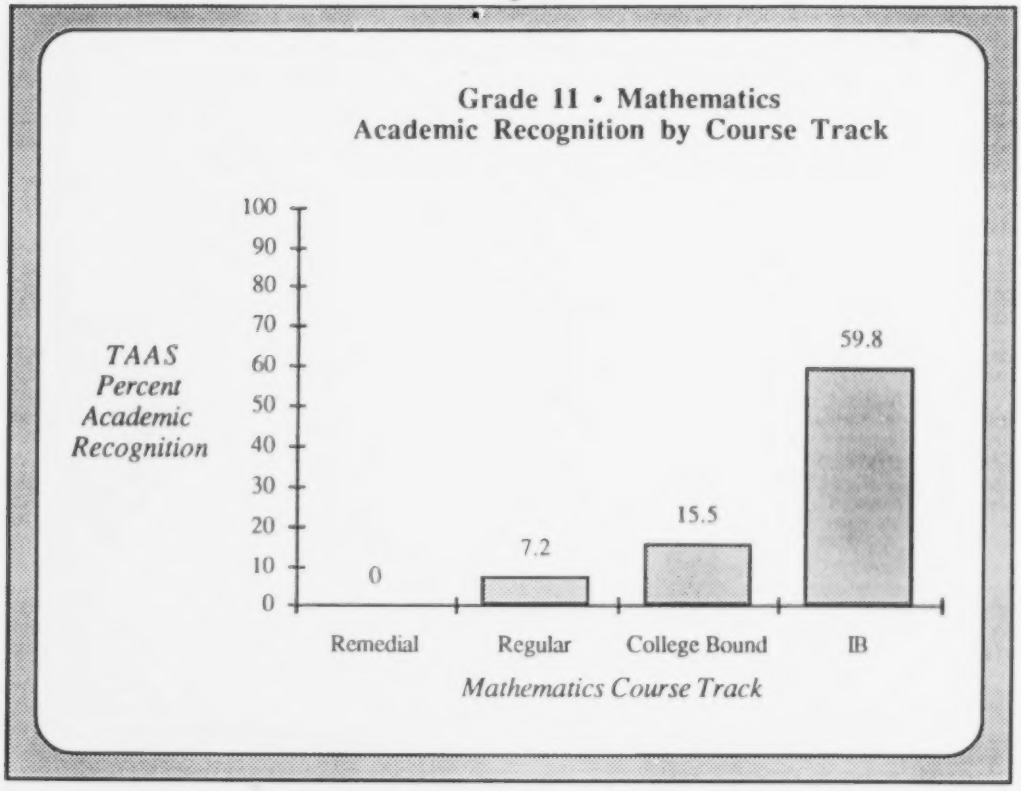
However, the difference between College Bound and the IB track mastery rates is not as clear-cut. College bound students passed the mathematics subtest at a 94.5% rate while 100% of the IB students passed. If the students in these two tracks were random samples drawn from the same population, a difference of this magnitude would occur 3.3 percent of the time (Fisher's Exact Test (N=192, One-Tail) p=.03331).

Of note is the fact that 21.9% (7 out of 32 students) of the students taking remedial math courses demonstrated mastery of the material on the TAAS eleventh grade math subtest. That is to say, 7 of the eleventh grade students who were judged to be unready for Regular track eleventh grade math courses were deemed to have mastered the content of regular tenth grade math by the

TAAS test. Also of note is the fact that 28.7% (60 students) of the students in regular math courses failed to pass the TAAS mathematics test.

Figure 12 illustrates the percent of students in each track that achieved the academic recognition level on the grade 11 TAAS mathematics subtest. Of the total student group of 433 students, 18.7% achieved this more stringent standard.

Figure 12



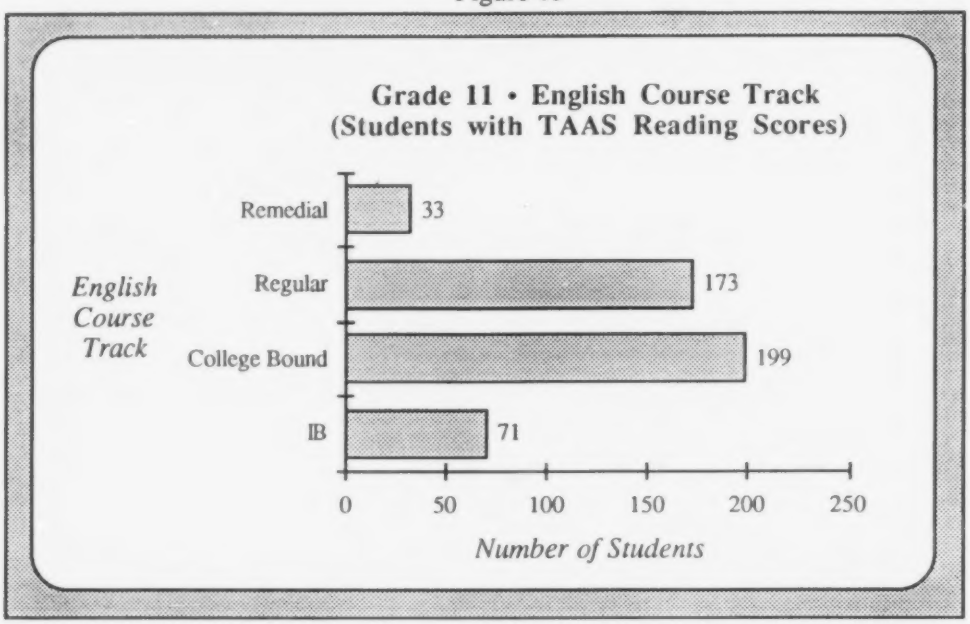
The substantial differences in academic recognition rates of the different course tracks mean that TAAS performance and mathematics course track are probably related (χ^2 (3, N=433)=117.26, p ≤.000005). The rank correlation indicates that 19.9% of the variance in academic recognition rates would be explained by taking course track into account (ρ =.44607).

Unlike the difference observed between College Bound and the IB track mastery rates, the difference between College Bound and IB academic recognition rates is substantial enough to demand rejection of the hypothesis that such a difference arose as a result of the random selection of students (χ^2 (1, N=192)=40.87 p ≤.000005). College bound 11th graders achieved academic recognition rates of 15.5% compared to 59.8% for IB 11th graders.

Reading

The number of eleventh grade students taking English courses aligned with particular instructional tracks and having TAAS reading scores is illustrated in Figure 13. TAAS eleventh grade reading scores were successfully matched to a total of 476 students in the four English tracks.

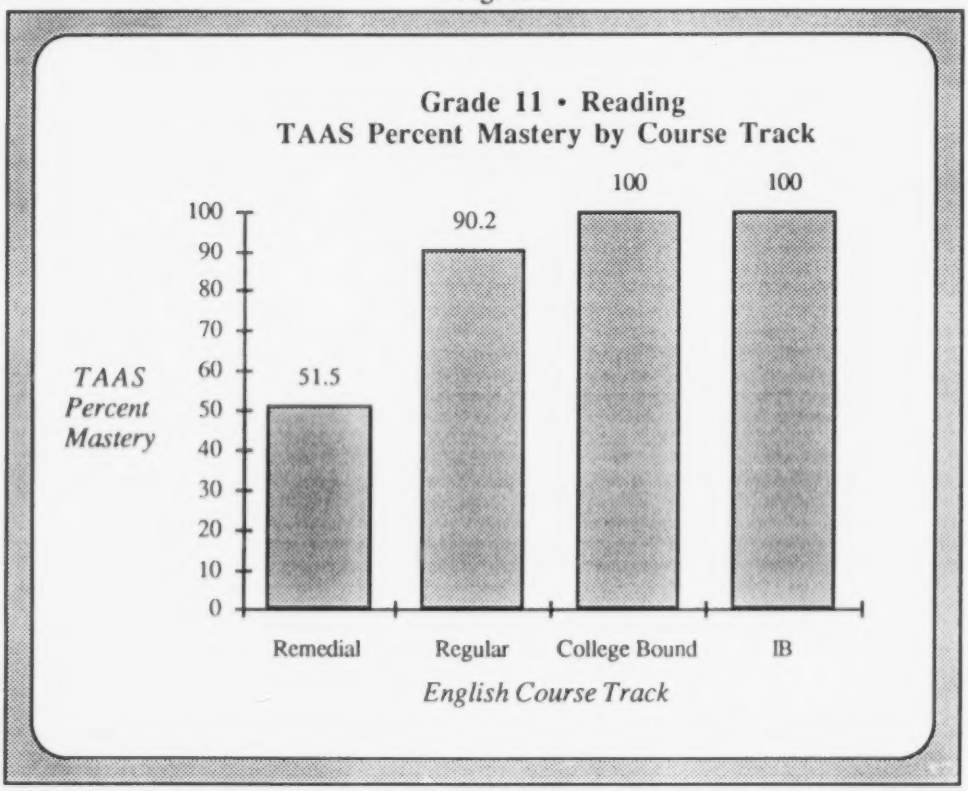
Figure 13



Remedial track students made up 6.9% of the total number of students having eleventh grade TAAS reading scores, Regular track students made up 36.3%, College Bound students made up 41.8% of the total and IB students comprised the other 14.9%.

Figure 14 illustrates the percent of students in each track, based on English courses, that demonstrated mastery of the material on the eleventh grade TAAS reading subtest. The overall passing rate for the 476 total students was 93.1%.

Figure 14

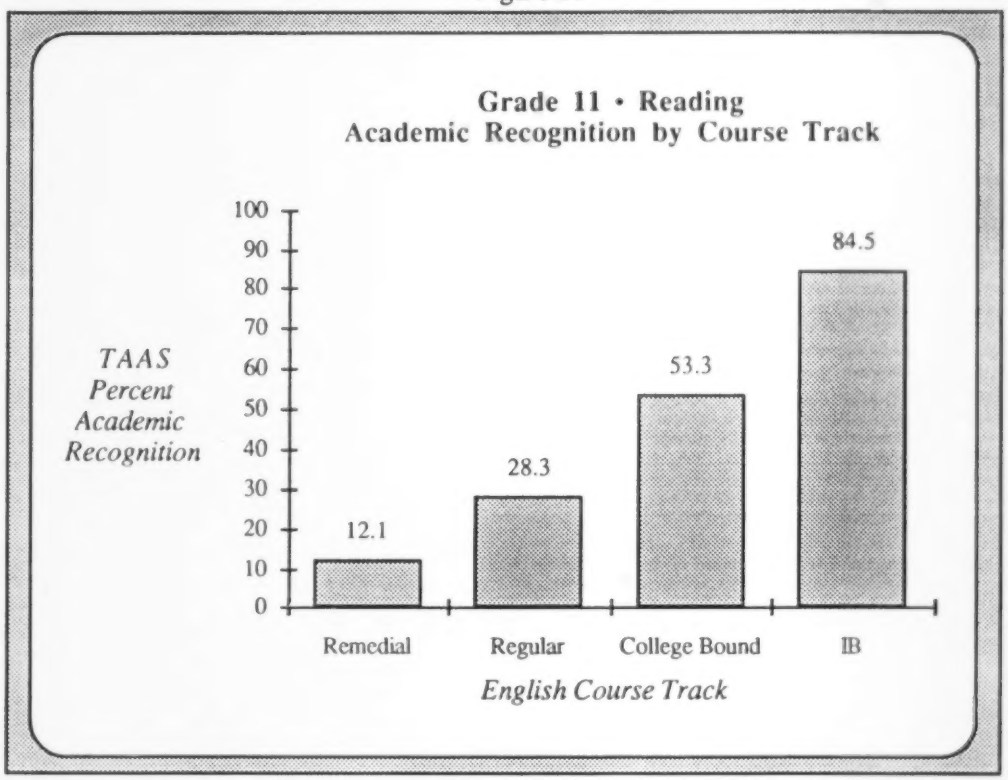


The differences in performance levels are substantial enough to demand rejection of the hypothesis that TAAS performance and English course track are independent of each other (χ^2 (3, N=476)=110.6, $p \leq .00001$). Note however, that the rank correlation indicates that only 12.8% of the variance in passing rates would be explained by taking course track into account ($\rho = .35761$).

The College Bound and IB mastery rates are identical and furthermore, the mastery rate for the Regular Track on the reading subtest is 90.2%. This figure compares favorably with the mastery rates of the two more competitive tracks. Ninety-six out of every hundred students in the three upper tracks mastered the reading subtest while only 1 out of every 2 students in the remedial track achieved mastery of the reading subtest.

Figure 15 illustrates the percent of students in each track that achieved the academic recognition level on the grade 11 TAAS reading subtest. Of the total student group of 476 students, 46.0% achieved this more demanding standard.

Figure 15



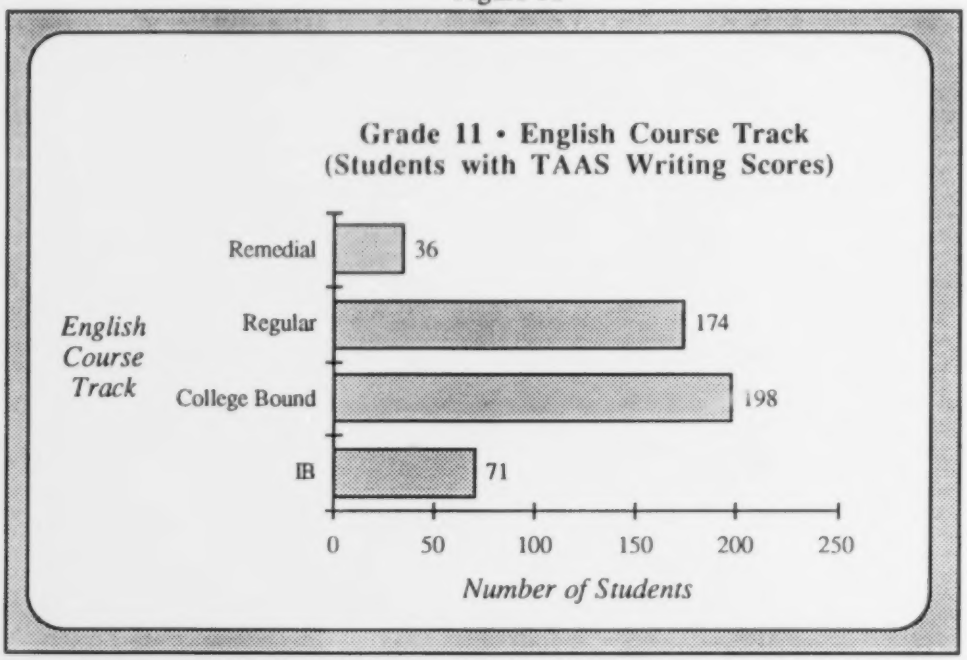
The differences in academic recognition rates argue against the hypothesis that TAAS performance and English course track function independently of each other (χ^2 (3, N=476=83.61, $p \leq .000005$). As shown by the graph above, each track had substantially different academic recognition rates. The graph also shows that the more selective tracks have a correspondingly higher academic recognition rate. The rank correlation indicates that 17.1% of the variance in academic recognition rates would be explained by taking course track into account (ρ =.41355).

The differences observed between College Bound and the IB track academic recognition rates are also large enough to conclude that they did not come about by random selection from the same population, (χ^2 (1, N=270)=21.56 $p \leq .000005$). Students in the IB track achieved academic recognition rates of 84.5% versus 53.3% for the College Bound students, a 31 percentage point difference.

Writing

The number of eleventh grade students taking English courses aligned with particular tracks and having TAAS writing scores is illustrated in Figure 16. TAAS eleventh grade writing scores were successfully matched to a total of 479 students in the four English tracks.

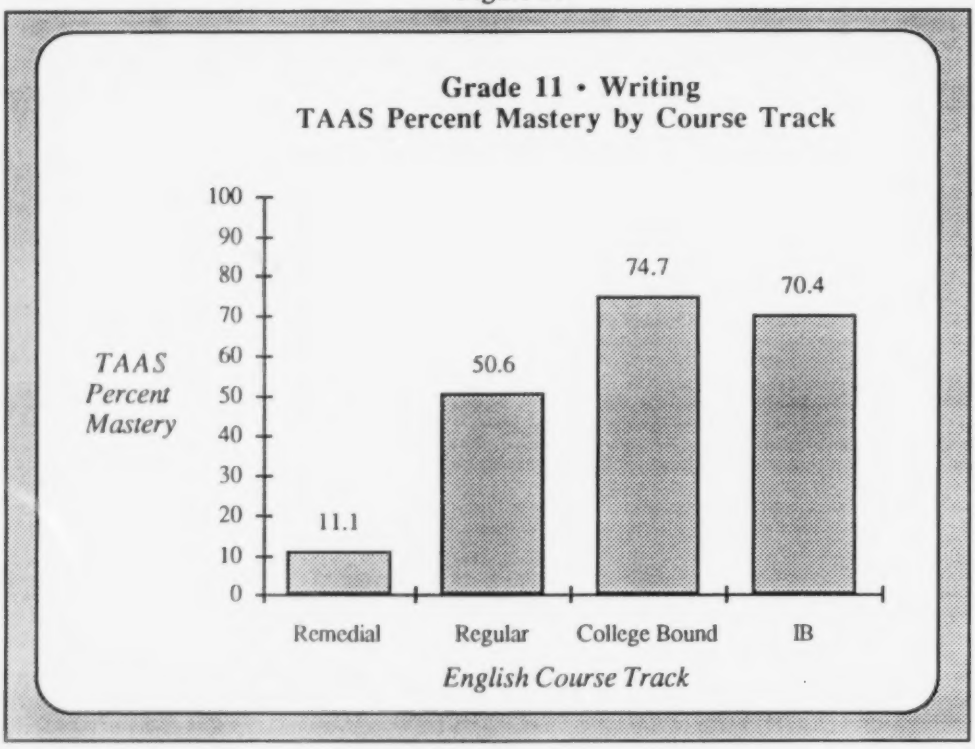
Figure 16



Remedial track students made up 7.5% of the total number of students having eleventh grade TAAS writing scores, Regular track students made up 36.3%, College Bound students comprised 41.3% of the total and IB students comprised 14.8%.

Figure 17 illustrates the percent of students in each track, based on English courses, that demonstrated mastery of the material on the eleventh grade TAAS writing subtest. The overall passing rate for the 476 total students was 60.5%.

Figure 17



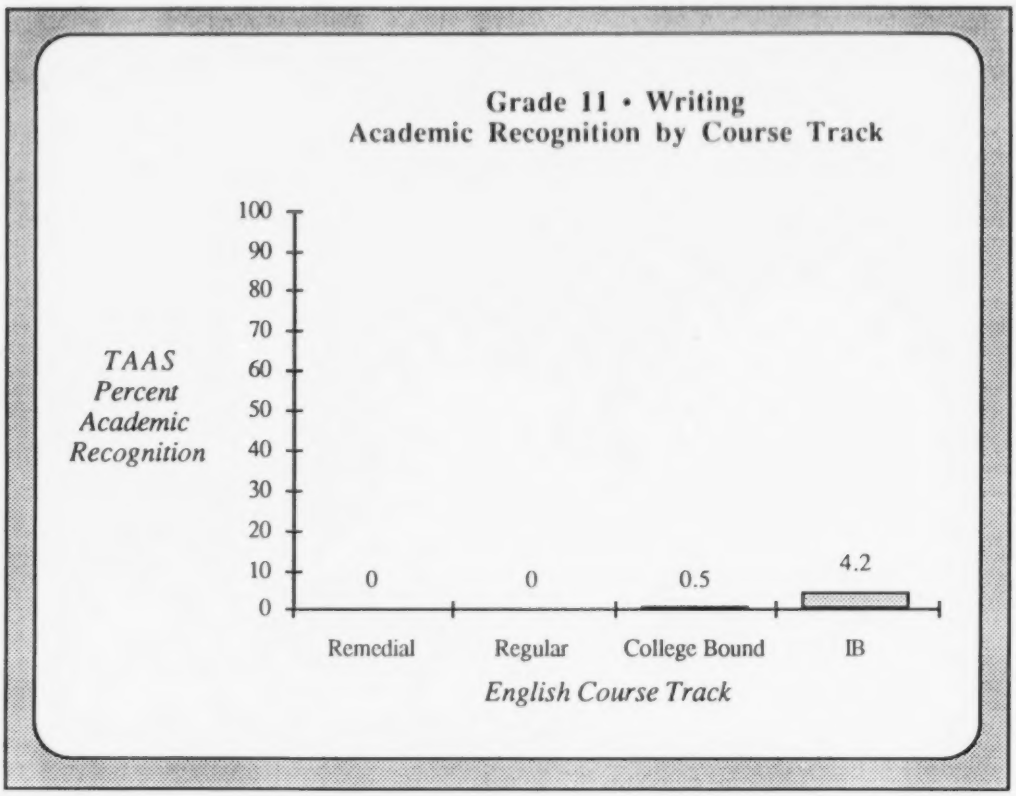
The differences in performance levels of the students allocated to the four course tracks are substantial enough to allow rejection of the hypothesis that TAAS performance and English course track are independent of each other (χ^2 (3, N=479)=63.69, $p \leq .000005$). The rank correlation, however, indicates that only 9.5% of the variance in passing rates would be explained by taking course track into account (ρ =.30822).

The writing subtest was the more demanding subtest as evidenced by the lower mastery rates for all four tracks. Approximately one out of two students in the Regular English track failed to master the material on the TAAS eleventh grade writing subtest. This is comparable to the Regular track mastery rate on the ninth grade writing subtest. However, the other three tracks showed substantial declines.

One notable fact here is the higher mastery rate achieved by College Bound students in comparison to students in the IB track. The difference is not substantial enough, however, to be termed statistically significant (χ^2 (1, N=269)=.50, p =.47811), and could occur as a result of random selection procedures 48% of the time.

Figure 18 illustrates the percent of students in each track that achieved the academic recognition level on the grade 11 TAAS writing subtest. Of the total student group of 479 students, only 4 students or .8% of the total achieved this more demanding standard.

Figure 18



Although there is a statistical indication that TAAS performance in this category is correlated with the tracking system (χ^2 (3, N=479=11.88, p =.00779), the more selective tracks have only a slightly higher academic recognition rate than the other tracks. The rank correlation indicates that only 1.46% of the variance in academic recognition rates would be explained by taking course track into account (ρ=.12069). Students in the IB track achieved academic recognition rates of 4.2% versus 0.5% for the College Bound students.

Research Question 2

Did students in each of the four tracks demonstrate appropriate academic growth during the 1990-91 school year as measured by the MAT6 Achievement test?

Method

The research question asks whether each of the four instructional tracks are accomplishing their goal of providing a year's academic growth to their students. This question thus requires that test scores received before the instructional treatment was begun be compared with achievement levels attained after completion of the prescribed course of study. The MAT6 tests are administered at the end of each school year and can thus provide both a before (8th grade) and after (9th grade) test score. Because the research question focuses on the effectiveness of instructional programs, only students who were promoted into the ninth grade are included in the analysis.

The statistical procedure employed in this case, the two-tailed *Matched-Pair t Test*, operates on the differences between pre- and post- test Normal Curve Equivalent scores to evaluate the hypothesis that the two groups (Before and After Treatment) are random samples drawn from the same population. If the *t* statistic is sufficiently large not to have arisen very often as a result of random selection procedures, the hypothesis may be rejected. It could then be maintained that a program effect had occurred. Since the purpose, however, of the tracking system is to provide a year's growth, or rather, to prevent a negative change in scores, the only pernicious effect to be on guard against is a negative change sufficiently large enough to be statistically significant. In cases where a positive, statistically significant, change occurs, the program must be accounted clearly successful.

The Normal Curve Equivalent score (NCE) is a standard score resulting from the division of the normal curve into 99 equal units. An NCE of 50.0 denotes average performance. Normal Curve Equivalent scores are used in mathematical calculations, but in themselves have no readily accessible intuitive meaning. National Percentile Ranks (NPR), on the other hand, indicate the relative standing of a pupil in comparison with other pupils of the same grade in the reference group (the "norm" group) who took the test at a comparable time. Like the NCE, an NPR of 50 denotes average performance. "Normal academic growth" with respect to National Percentile Ranks simply refers to a student maintaining his relative position in the score distribution as compared to students from the norm group.

Findings

The tables and graphs on the following pages present MAT6 Mean Normal Curve Equivalent scores and National Percentile Ranks for the Science and Social Studies subject area tests, composite scores for the Mathematics, Reading and Language tests, and the Complete Battery composite score. The four instructional tracks are treated separately.

Remedial Track Grade 9 MAT6 Results

Remedial Track MAT6 Performance

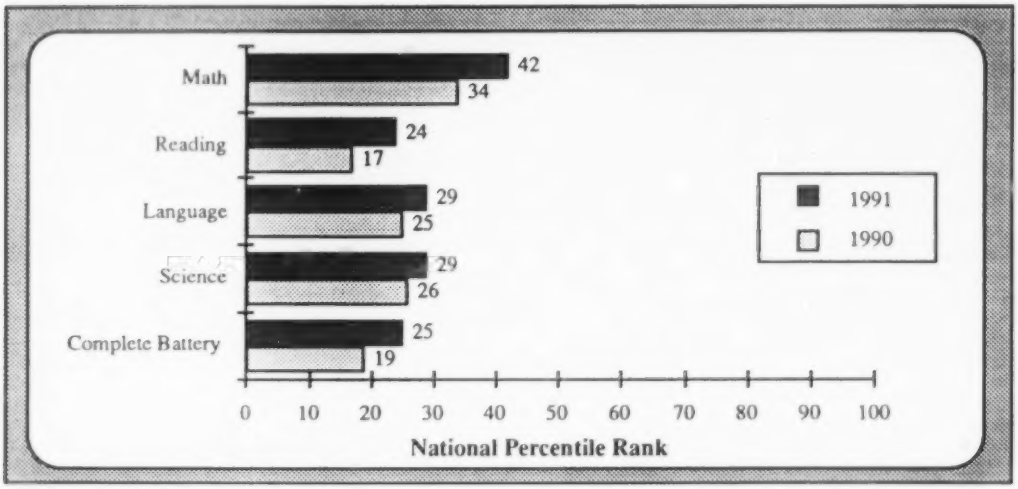
Subtest	N	1990 NCE(NPR)	1991 NCE(NPR)	Difference NCE(NPR)	t Value	2-tail Probability
Mathematics	90	41.5(34)	45.5(42)	4.0(8)	4.23	≤.0005
Reading	27	30.2(17)	35.0(24)	4.8(7)	3.89	.001
Language	26	35.7(25)	38.1(29)	2.4(4)	1.35	.19
Science	17	36.6(26)	38.6(29)	2.0(3)	0.56	.584
Social Studies	n/a	n/a	n/a	n/a	n/a	n/a
Complete Battery	20	31.6(19)	35.6(25)	4.0(6)	5.77	≤.0005

- The Remedial track students who were promoted into ninth grade in 1990/91 showed clear gains in Mathematics, Reading and Complete Battery scores.
- The differences in Remedial track pre/post scores in Language and Science could have arisen as a result of random selection procedures often enough that a program effect beyond the regular year's academic growth cannot be assured. However, the gains are positive and thus indicate at least a normal year's academic progress.

The following graph presents Remedial track National Percentile Ranks (NPR) for the subjects under consideration. As indicated earlier, the changes from 1990 to 1991 are all positive. "Normal academic growth" would be constituted by no change in score.

Figure 19

MAT6 National Percentile Ranks
Remedial Track
(1990/1991)



- Increases in National Percentile Ranks ranged from a low in science of 3 to a high in math of 8. All percentile ranks were below what constitutes average performance for the population as a whole.

Regular Track Grade 9 MAT6 Results

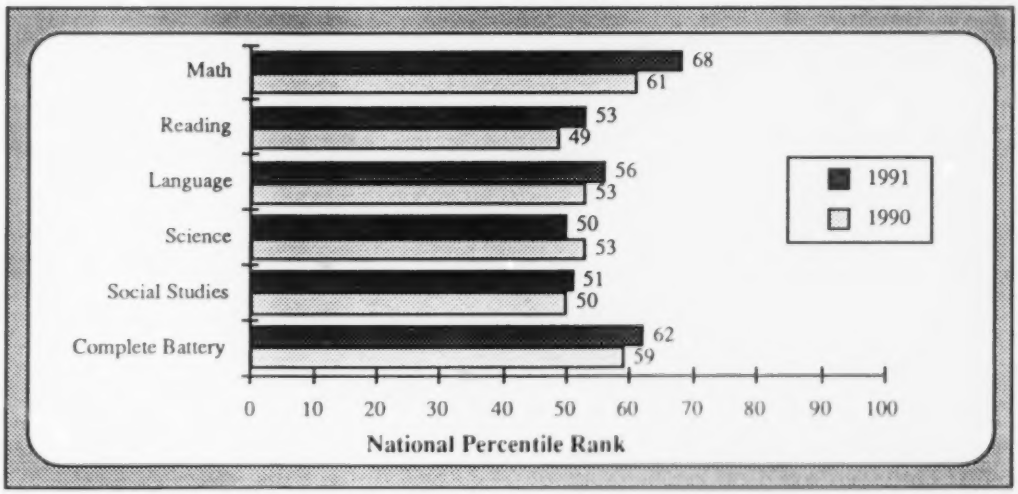
Regular Track MAT6 Performance

Subtest	N	1990 NCE(NPR)	1991 NCE(NPR)	Difference NCE(NPR)	t Value	2-tail Probability
Mathematics	103	55.8(61)	60.0(68)	4.2(7)	5.69	≤.0005
Reading	162	49.2(49)	51.3(53)	2.1(4)	2.32	.021
Language	160	51.6(53)	53.0(56)	1.4(3)	1.93	.056
Science	165	51.3(53)	50.0(50)	-1.3(-3)	-1.44	.152
Social Studies	170	49.8(50)	50.4(51)	0.6(1)	0.65	.519
Complete Battery	77	54.7(59)	56.4(62)	1.7(3)	2.45	.017

- Regular track students showed clear gains in their Mathematics achievement level.
- The differences in Regular track pre/post scores in Reading, Language and Social Studies could have arisen as a result of random selection procedures often enough that a program effect beyond the regular year's academic growth cannot be assured. However, the gains are positive and thus indicate at least a normal year's academic progress.
- Science scores showed a three percentile rank decline. The decline is not large enough, however, to provide assurance that the decline is not due to the normal variation associated with a sample of 165 students.

Figure 20

MAT6 National Percentile Ranks
Regular Track
(1990/1991)



- National Percentile Rank changes ranged from a drop of 3 ranks in science to an increase of 7 ranks in math.

College Bound Grade 9 MAT6 Results

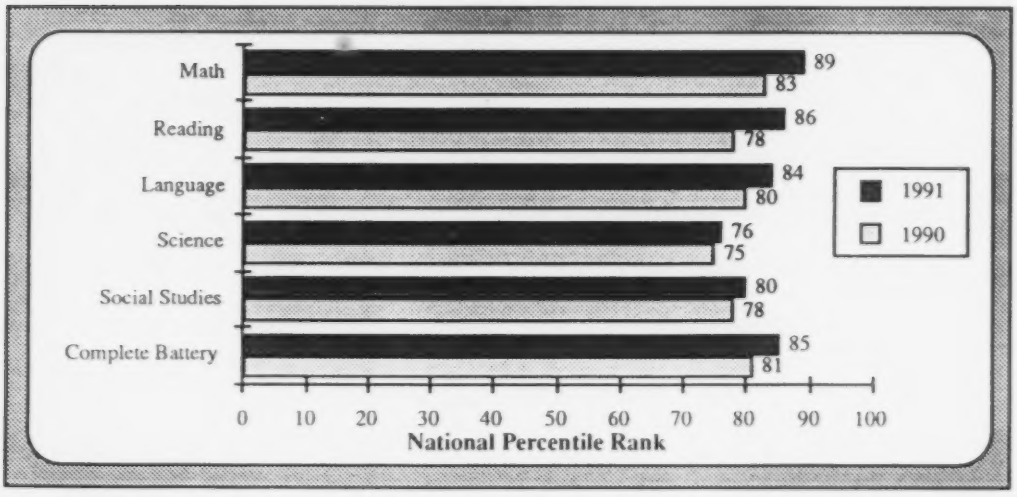
College Bound Track MAT–6 Performance

Subtest	N	1990 NCE(NPR)	1991 NCE(NPR)	Difference NCE(NPR)	t Value	2-tail Probability
Mathematics	150	70.2(83)	75.8(89)	5.6(6)	6.9	≤.0005
Reading	174	66.4(78)	72.7(86)	6.3(8)	6.79	≤.0005
Language	172	68.0(80)	70.7(84)	2.7(4)	3.09	.002
Science	165	64.5(75)	65.1(76)	0.6(1)	0.67	.503
Social Studies	150	66.1(78)	67.5(80)	1.4(2)	1.69	.093
Complete Battery	127	68.6(81)	72.2(85)	3.6(4)	6.22	≤.0005

- College Bound students showed clear gains, beyond a normal year's academic growth, in Mathematics, Reading and Language.
- In science and social studies, the differences achieved could have arisen solely as a result of random selection procedures often enough that a program effect beyond the regular year's academic growth cannot be assured. However, the gains are positive and thus indicate at least a normal year's academic progress.

Figure 21

MAT6 National Percentile Ranks
College Bound Students
(1990/1991)



- Increases in National Percentile Ranks ranged from a low of 1 in science to a high of 8 in reading.

International Baccalaureate Grade 9 MAT6 Results

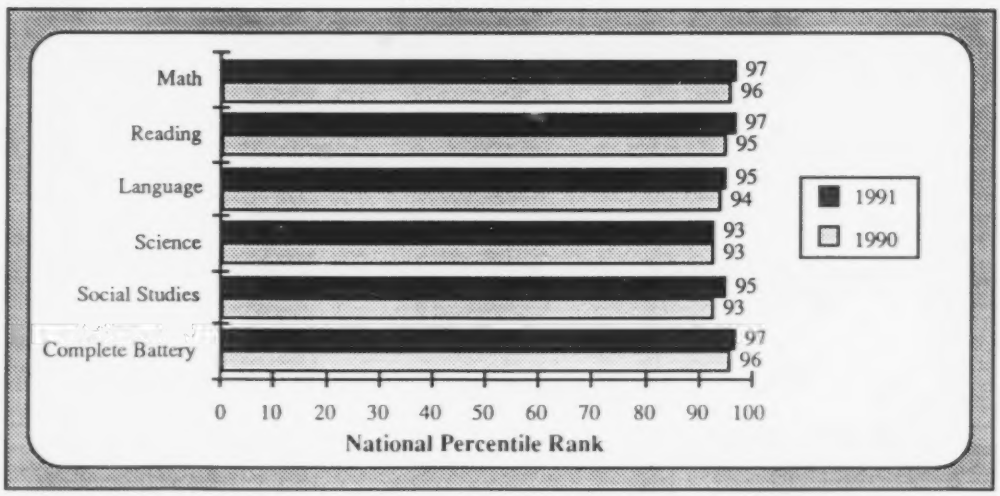
International Baccalaureate MAT6 Performance

Subtest	N	1990 NCE(NPR)	1991 NCE(NPR)	Difference NCE(NPR)	t Value	2-tail Probability
Mathematics	104	86.5(96)	89.0(97)	2.5(1)	2.50	.014
Reading	101	84.4(95)	89.9(97)	5.5(2)	4.71	≤.0005
Language	101	82.3(94)	84.6(95)	2.3(1)	2.21	.03
Science	110	81.1(93)	81.6(93)	0.5(0)	0.42	.679
Social Studies	110	81.6(93)	83.6(95)	2.0(2)	1.95	.054
Complete Battery	81	87.1(96)	89.3(97)	2.2(1)	3.03	.003

- Students in the International Baccalaureate program showed a clear gain, beyond a normal year's academic growth, in Reading.
- In mathematics, language, science and social studies, the gains achieved could have arisen often enough as a result of random selection procedures that a program effect beyond the regular year's academic growth cannot be assured. However, the gains are positive and thus indicate at least a normal year's academic progress.
- International Baccalaureate percentile ranks were already extremely high. Substantial increases, beyond the normal year's growth, would have been very difficult to achieve.

Figure 22

MAT6 National Percentile Ranks
International Baccalaureate Students
(1990/1991)

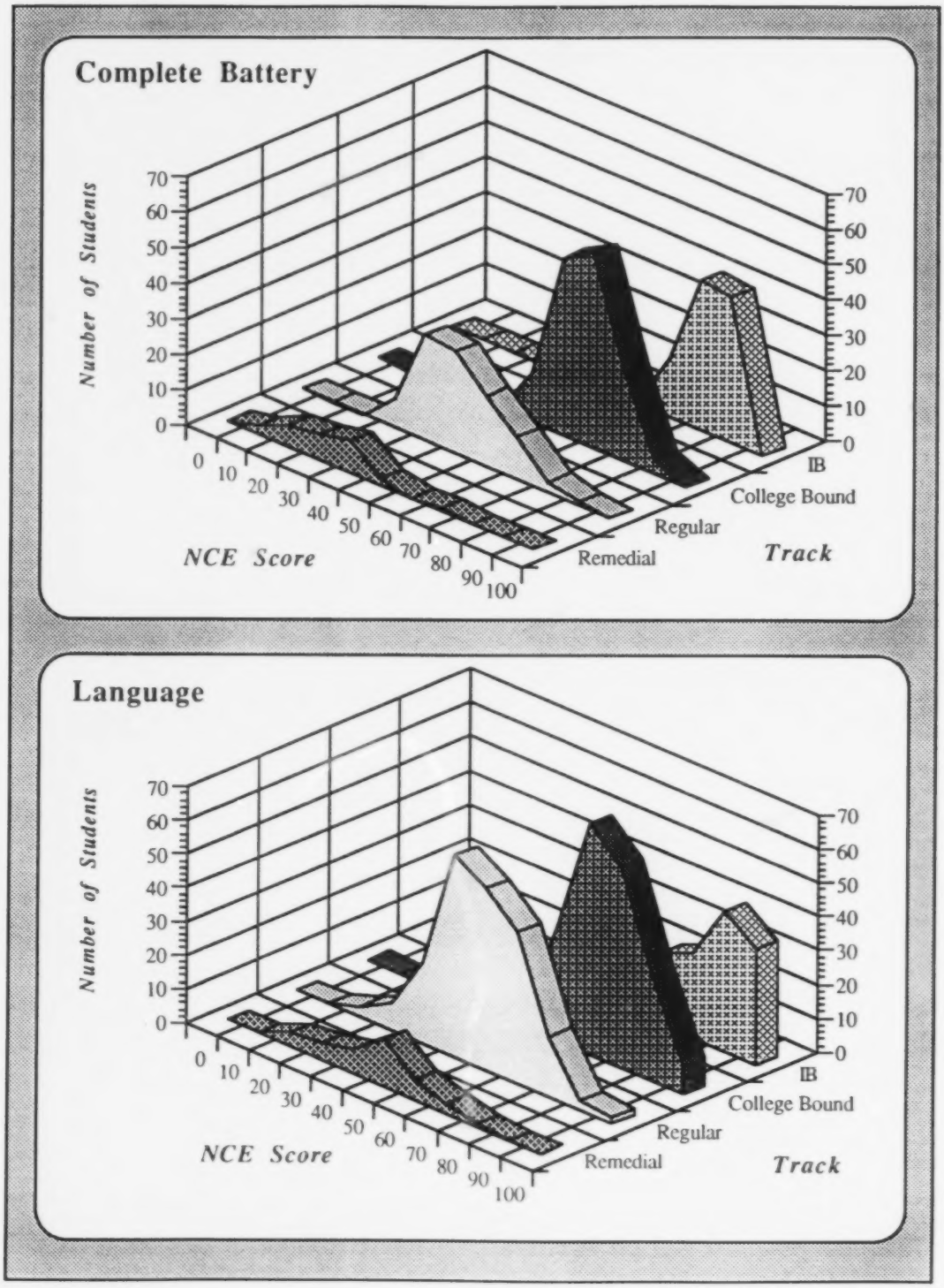


- National Percentile Rank differences ranged from 0 in science to 2 in reading.

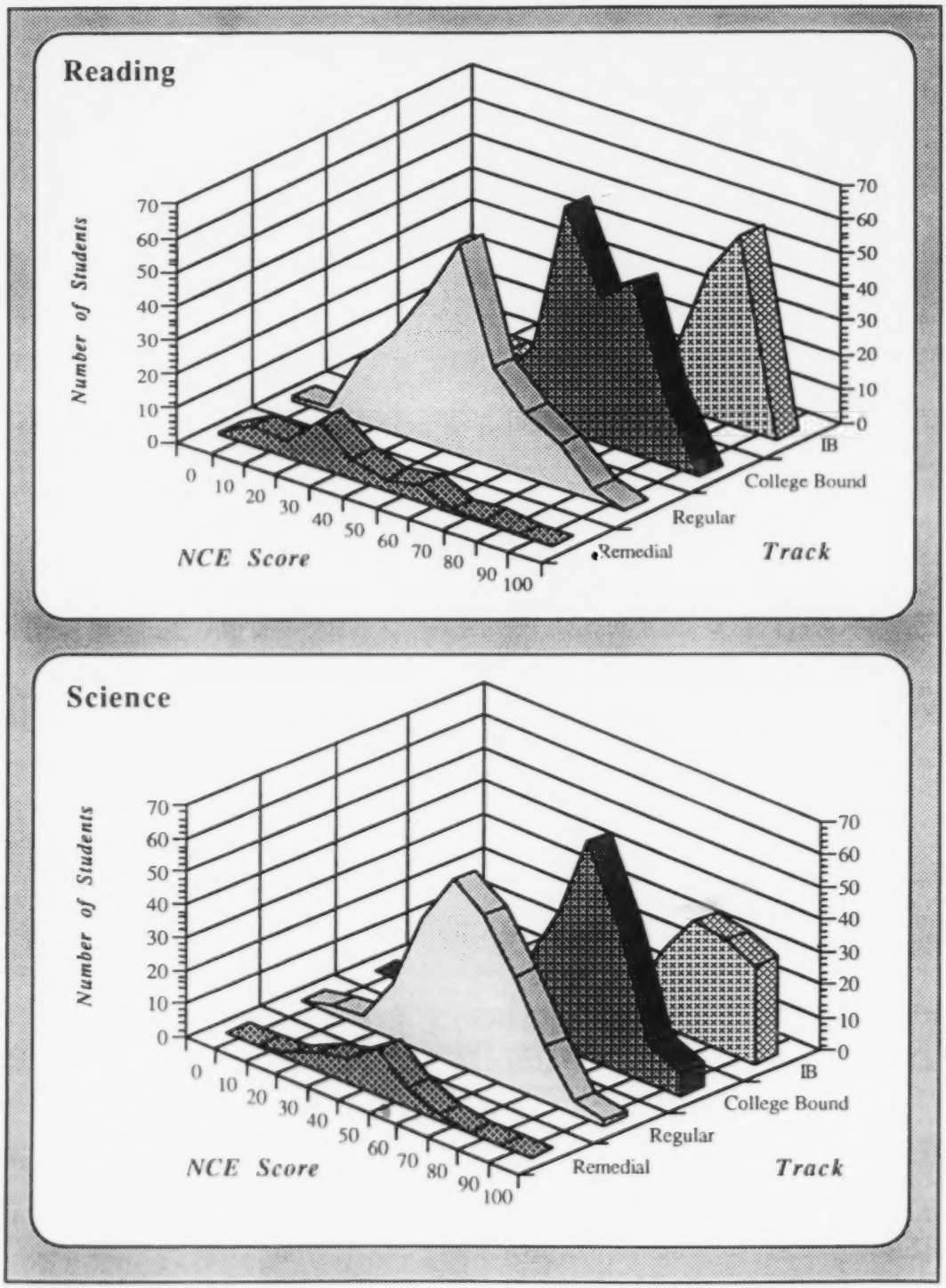
1990/91 MAT6 • Grade 9
Normal Curve Equivalent Score Distributions

The graphs on the following three pages present distributions of normal curve equivalent scores for the Complete Battery composite, the Language, Mathematics and Reading composites, and the Science and Social Studies subtests by the four tracking groups for the April, 1991 administration of the MAT6 tests to students in ninth grade at Lamar. The presentation until now has concentrated on mean scores or percentile ranks, and thus has not given an adequate sense of the distribution of performance levels within each tracking group. These graphs display the range of achievement within each group as well as the differences between groups. If discrete scores had been plotted, the non-continuous nature of the possible NCE scores for some tests (the number of items on a test determines how many "slots" can be filled in the distribution), would have made interpretation of the score distributions difficult. Therefore, the scores were grouped into ten unit intervals to display a more readily understandable distribution shape.

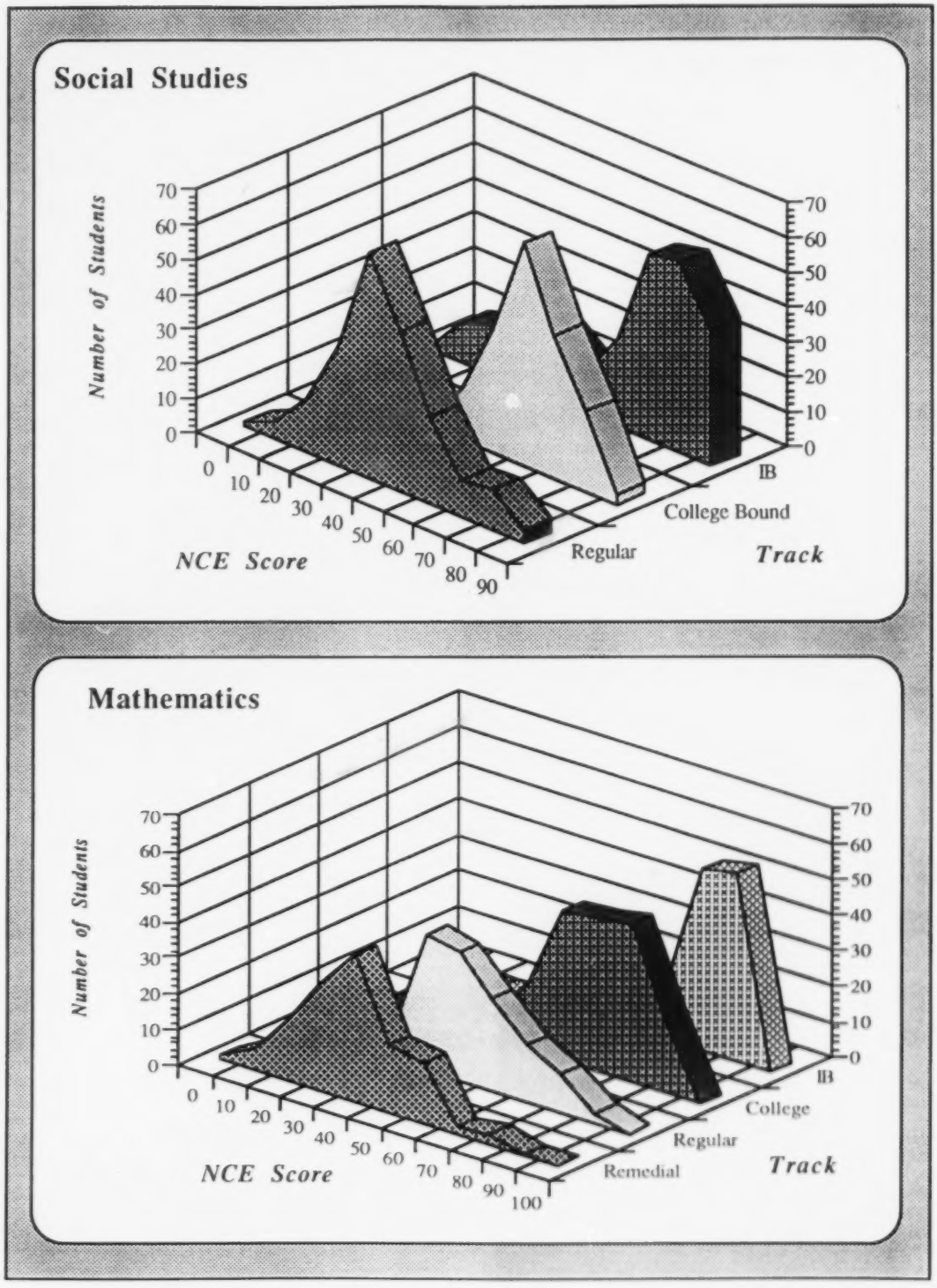
1990/91 MAT6 • Grade 9
Normal Curve Equivalent Score Distributions



1990/91 MAT6 • Grade 9
Normal Curve Equivalent Score Distributions



1990/91 MAT6 • Grade 9
Normal Curve Equivalent Score Distributions



Appendix

Zoned/Non-Zoned/Magnet Comparisons

Figures

A1–A4 ..... Grade 9 TAAS • Zoned/Non-Zoned

A5–A8 ..... Grade 9 TAAS • Zoned/Magnet

A9 ..... Grade 9 MAT6 • Zoned/Non-Zoned

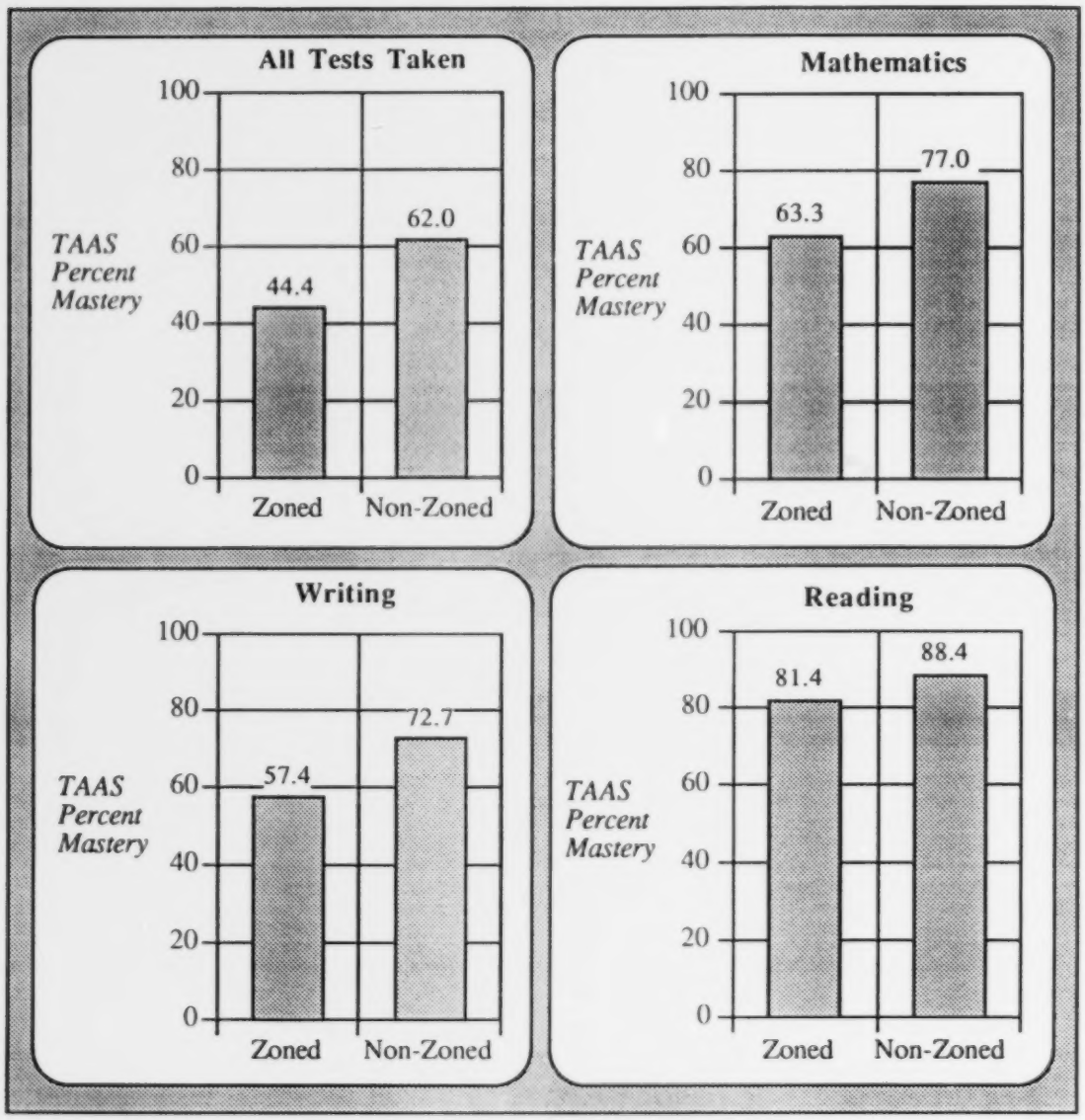
A10..... Grade 9 MAT6 • Zoned/Magnet

A11–A14 ..... Grade 11 TAAS • Zoned/Non-Zoned

A15–A18 ..... Grade 11 TAAS • Zoned/Magnet

Figures A1–A4

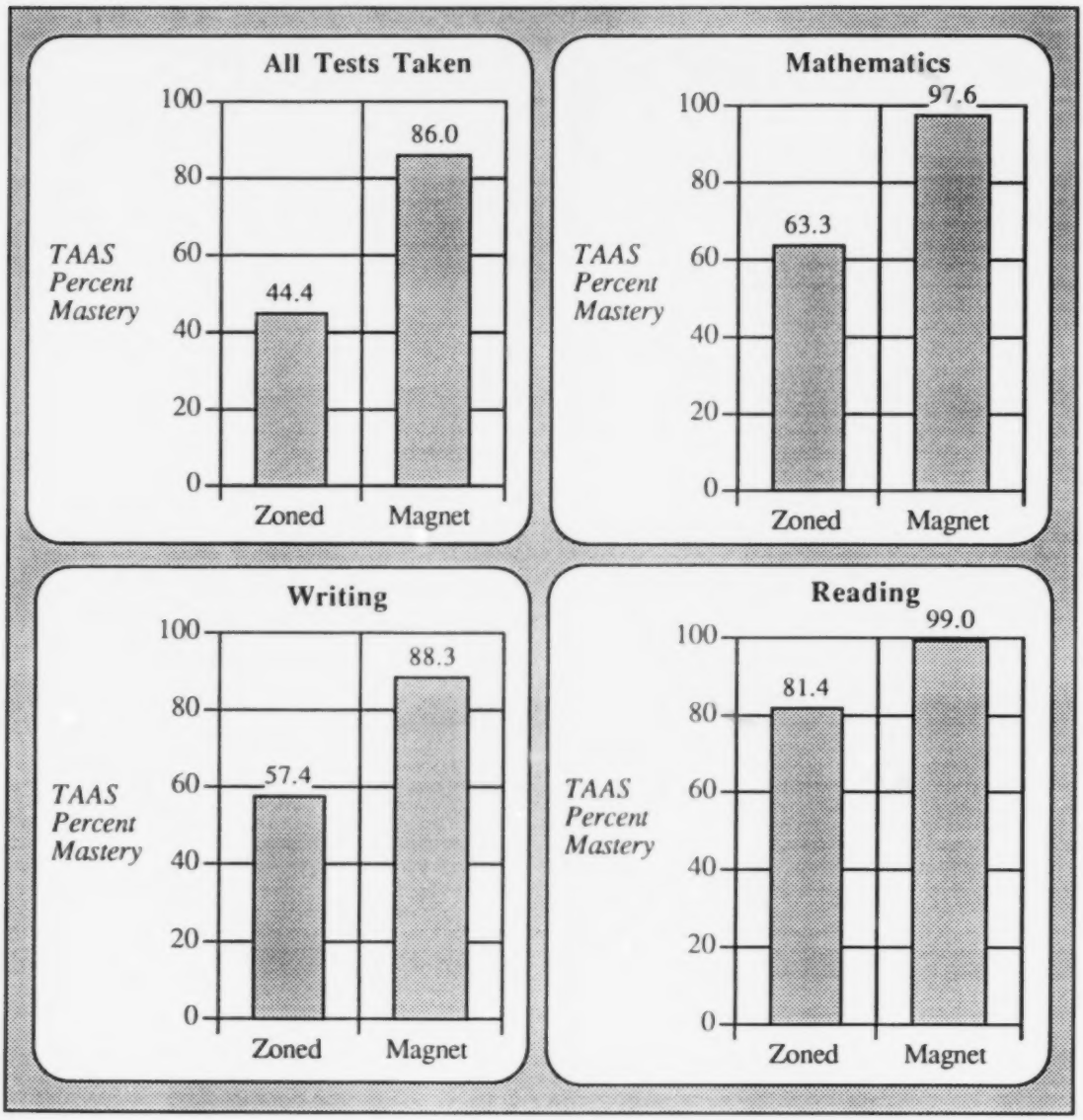
Grade 9 TAAS • Percent Mastery
Zoned/Non-Zoned



Non-zoned students achieved higher mastery rates in all four TAAS categories at the ninth grade level compared to their zoned counterparts. The differences ranged from a high of 17.6 percentage points on the All Tests Taken category to a low of 7 percentage points in Reading. In addition, there was a 15.3 percentage point difference in Writing and a 13.7 percentage point difference between the two groups on the Mathematics subtest.

Figures A5–A8

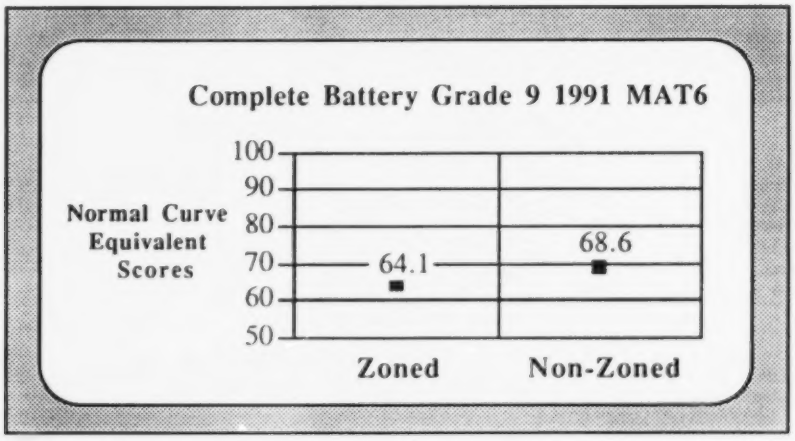
Grade 9 TAAS • Percent Mastery
Zoned/Magnet



Ninth grade magnet students also achieved higher mastery rates in all four TAAS categories than students zoned to the school. The differences ranged from a high of 41.6 percentage points on the All Tests Taken category to a low of 17.6 percentage points in Reading. In addition, there was difference of 34.3 percentage points in Mathematics and 30.9 points on the Writing subtest.

Figure A9

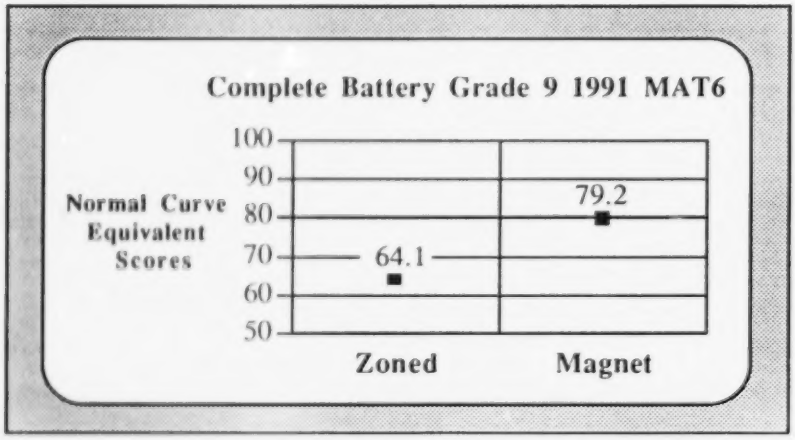
Grade 9 MAT6 • Normal Curve Equivalent Scores Zoned/Non-Zoned



Non-Zoned ninth grade students averaged 4.5 normal curve equivalent scores higher than zoned students on the 1991 MAT6 Complete Battery composite.

Figure A10

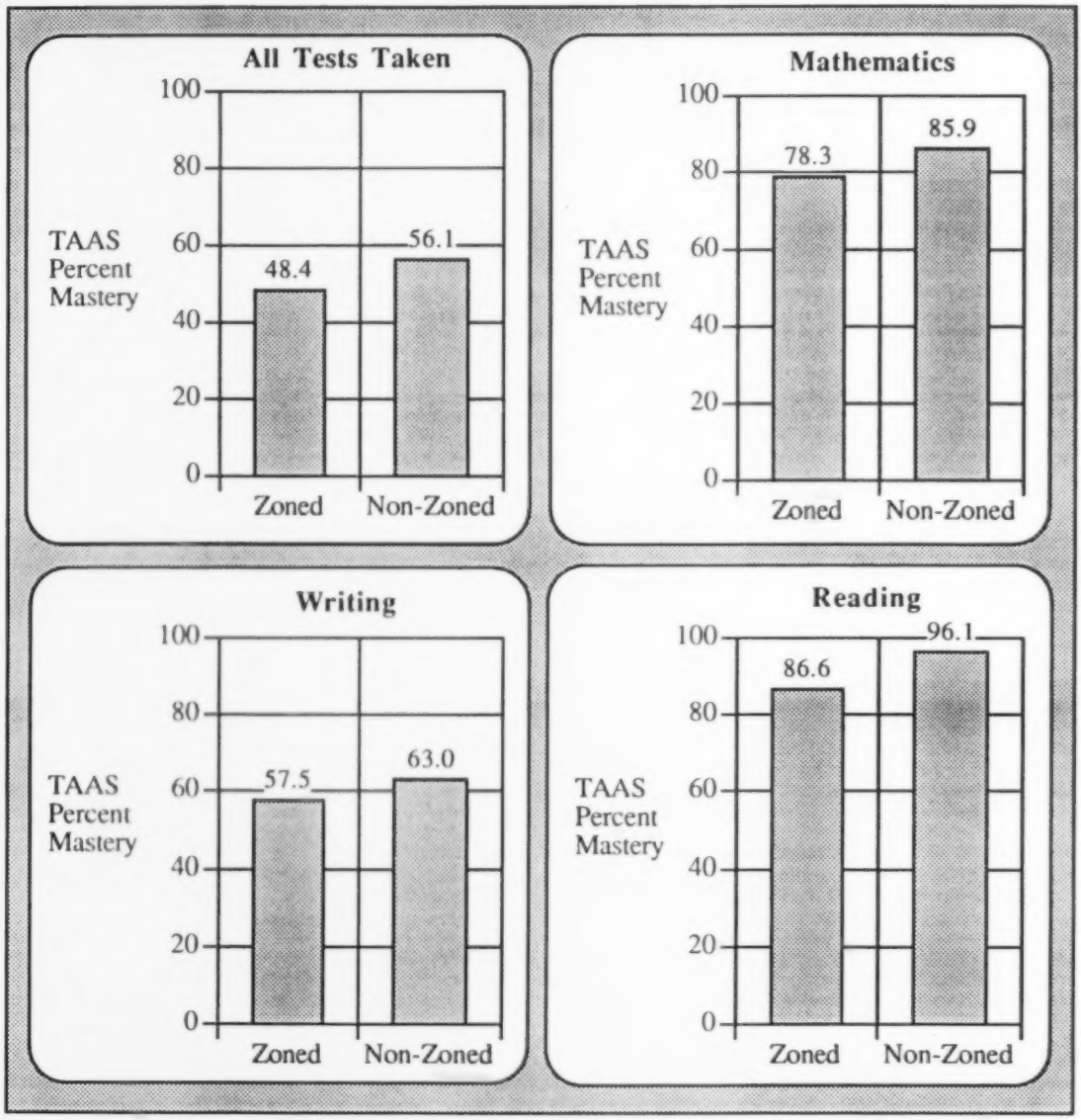
Grade 9 MAT6 • Normal Curve Equivalent Scores Zoned/Magnet



Ninth grade magnet students averaged 15.1 normal curve equivalent scores higher than zoned students on the 1991 MAT6 Complete Battery composite.

Figures A11–A14

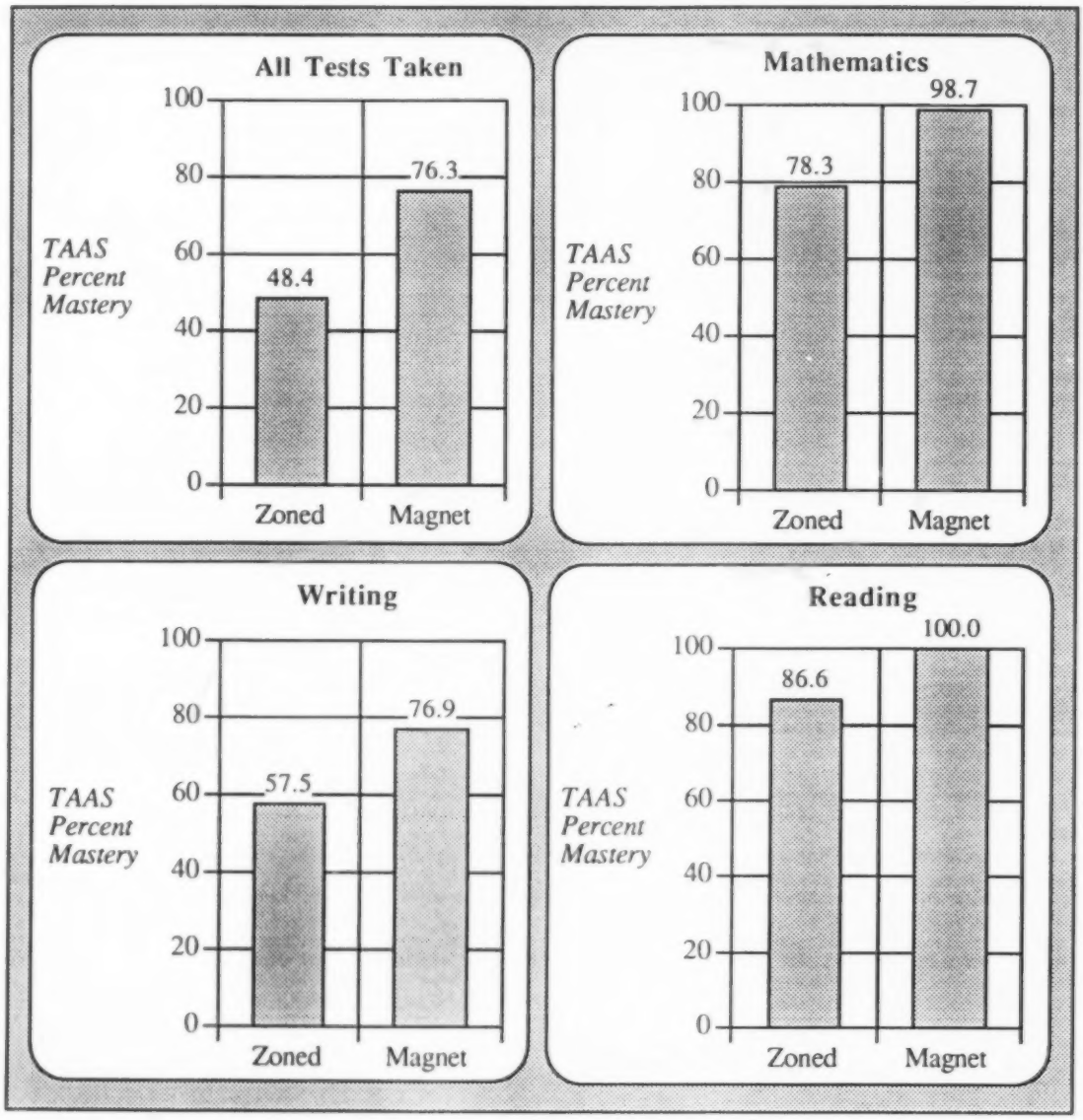
Grade 11 TAAS • Percent Mastery
Zoned/Non-Zoned



Non-zoned students achieved higher mastery rates compared to zoned students on all four TAAS categories at the eleventh grade level. The differences ranged from a high of 9.5 percentage points in Reading to a low of 5.5 percentage points in Writing. In addition, there was a 7.7 percentage point difference on the All Tests Taken category between zoned and non-zoned students. In Mathematics the difference was 7.6 percentage points.

Figures A15–A18

Grade 11 TAAS • Percent Mastery
Zoned/Magnet



Eleventh grade magnet students achieved higher mastery rates on all four TAAS categories compared to their zoned counterparts. The differences ranged from a high of 27.9 percentage points on the All Tests Taken category to a low of 13.4 percentage points in Reading. In addition, there was a difference of 20.4 percentage points on the Mathematics subtest and 19.4 points on the Writing test.

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